Cloning Utility for Rockwell Automation Industrial Computers

About This Publication

This publication provides instructions on how to use the Industrial Computer System Cloning Utility with these Rockwell Automation industrial computers:

- 6155R Compact Non-display Computers, series E or later
- 6181P Integrated Display Computers, series E or later

For older series computers, refer to the Cloning Utility Technical Data, publication 6000-TD001. You can view or download this publication at http://literature.rockwellautomation.com.

About the Cloning Utility

The Industrial Computer System Cloning Utility lets you create a backup image of your computer's hard drive. If your system becomes unstable or corrupt, you can restore the hard drive from the backup image. There is no restriction on the number of times you create or restore a backup image.

When using the automated cloning utility, the active system partition of your computer's hard drive can backup to and restore from the recovery partition. The active system partition runs the operating system. The recovery partition stores a backup image of the system. The automated cloning utility creates a recovery partition if one does not exist or resizes the partition if too small. Each time you create a backup image in the recovery partition, the previously archived image is replaced.

IMPORTANT This version of the cloning utility does not allow the creation of bootable CD/DVD discs. Refer to the Advanced Menu for other options to store the system image externally.

The cloning utility resides on the Industrial Computer System Cloning Utility CD that is shipped with every Industrial Computer.

This document provides instructions on how to:

- create, resize or delete a recovery partition on the hard drive.
- create a backup of the active system image in the recovery partition of the hard drive.
- restore an archived system image from the recovery partition.
- use the Ghost Utility to perform system operations manually.
- create and restore system images to a network location.

Recovery Partition Considerations

Rockwell Automation Industrial Computers with rotating hard drives are shipped with the factory image stored in a recovery partition of drive. This image can be restored in the event of system problems.

Computers with a solid-state drive are not shipped with a factory default image on the drive to conserve space.

Prepare to Boot from the Accessories CD

To boot from the Industrial Computer System Cloning Utility CD, you must load the CD in the CD-ROM or DVD-ROM drive before the computer boots the operating system from the hard drive. The time between power on and the operating system boot from the hard drive varies between computers, but can be as little as three seconds.

ATTENTION

The moment the operating system begins to boot from the hard drive, the installed factory image is altered from its original state.

Follow these steps to prepare for booting from your computer's CD-ROM or DVD-ROM drive:

1. Connect a USB CD/DVD-ROM drive if an internal drive is not available.

   Make sure no other USB storage devices are connected to the computer.

2. Enter the CMOS setup in BIOS by pressing the F2 key during BIOS POST, when the system memory and hard drive information appears.

3. Verify that the CD/DVD-ROM is set to a higher priority than the hard drive; if not, change the priority.

4. Eject the CD/DVD-ROM tray.

5. Insert the CD you want to boot from into the CD/DVD-ROM tray.

6. Push the tray in to the operating position.

7. If you set the CD/DVD-ROM boot order priority to a higher priority than the hard drive, save and exit CMOS setup. Otherwise, exit without saving changes.

IMPORTANT

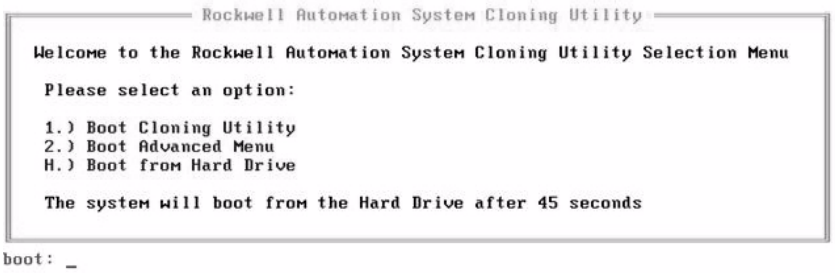
Ctrl+Alt+Delete performs a soft boot of the computer but does not retain changes in CMOS setup.

Start the Cloning Utility

Follow these steps to start the cloning utility:

1. Insert the Industrial Computer System Cloning Utility CD in the CD/DVD-ROM drive of your computer.
2. Power on the computer.

IMPORTANT You have 45 seconds to choose an option from the Selection Menu. When the timer expires the system will boot from the hard disk drive.



3. Type 1 and press Enter to launch the Boot Cloning Utility.

   Other options let you:

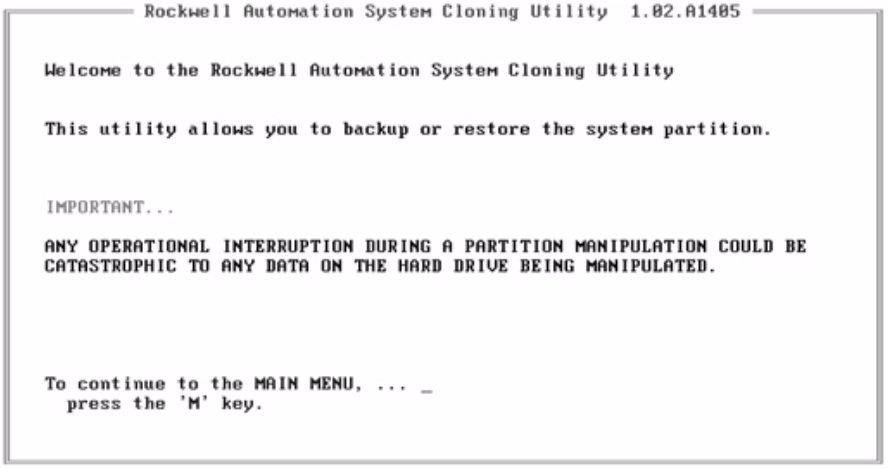
   a. launch the Advanced Menu.

   b. boot from the Operating System drive.

   c. quit the utility and have the system boot from the next boot device.

4. Read the Welcome screen, then press M to open the Main Menu.

IMPORTANT Any operational interruption could result in data loss. It is important that you operate the computer from a clean, stable, charged, uninterruptible power supply to minimize the risk of power interruption during cloning operations.



Create a Backup Image

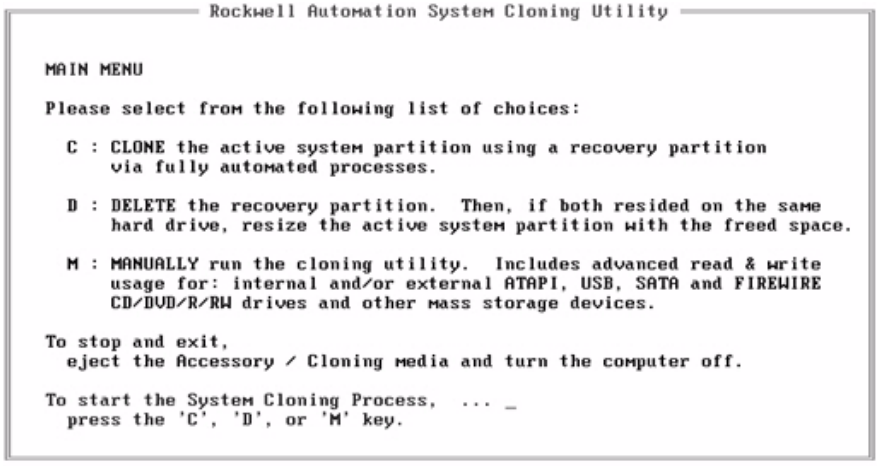
This section shows how to start the process that will create a backup image of the active system partition. During this process, the cloning utility checks that the:

- recovery partition exists.
- recovery partition is large enough to store backup image.

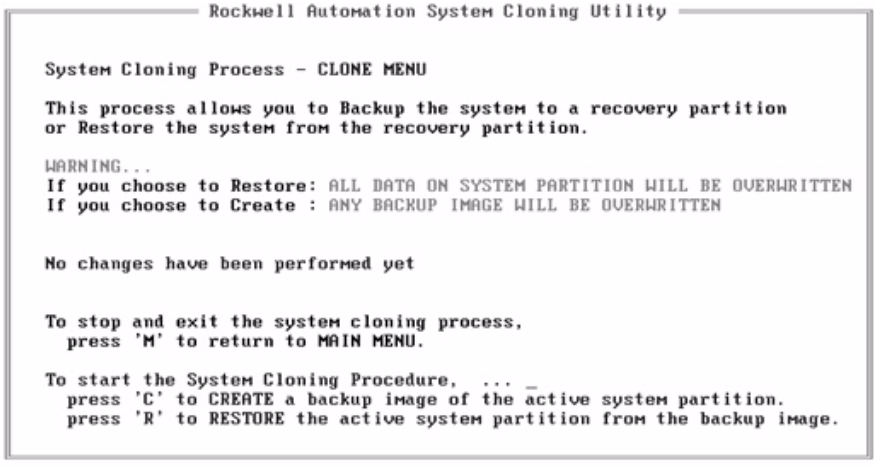
If the recovery partition is not found or not large enough to store the backup image, the utility will inform you so that you can take corrective action.

Follow these steps to start the process of creating a backup image:

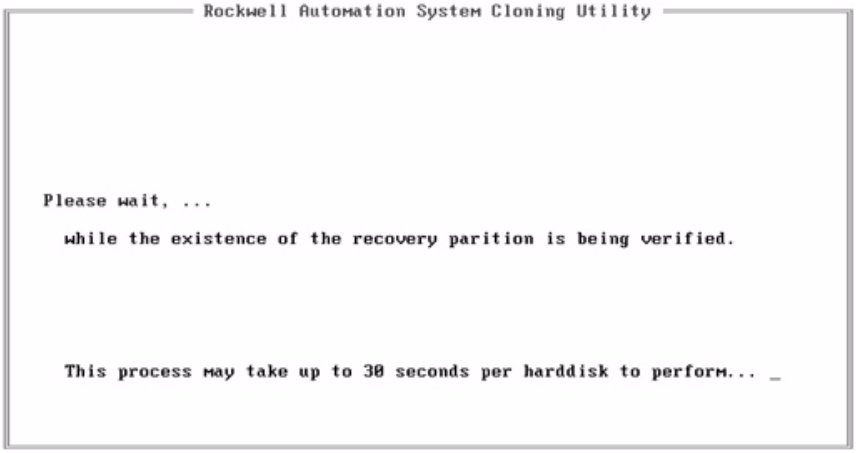
1. Press C from the Main Menu to display the Clone menu.



2. Press C from the Clone Menu to create the backup image.



The cloning utility searches for the recovery partition.



One of three conditions may occur:

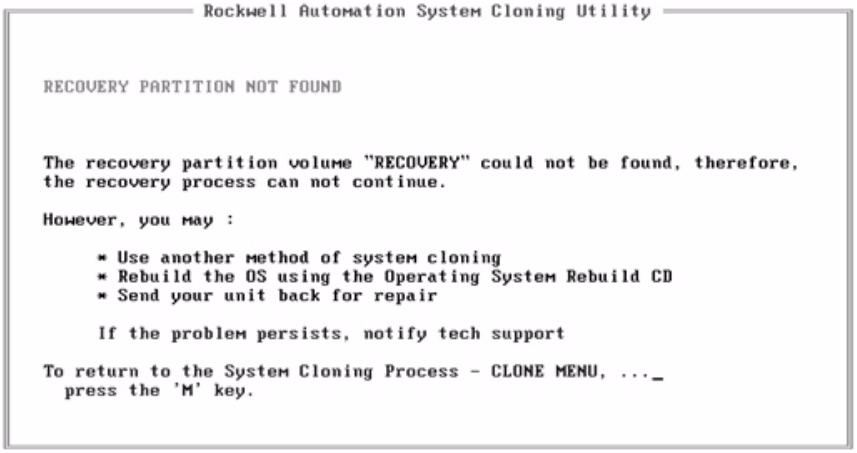
If	Go to	Page
The recovery partition is not found, a corresponding message appears.	Create a Recovery Partition	7
The recovery partition is too small for the backup operation, a corresponding message appears.	Resize the Recovery Partition	9
Neither of the above conditions occurs.	Back up the Active System Image	10

Create a Recovery Partition

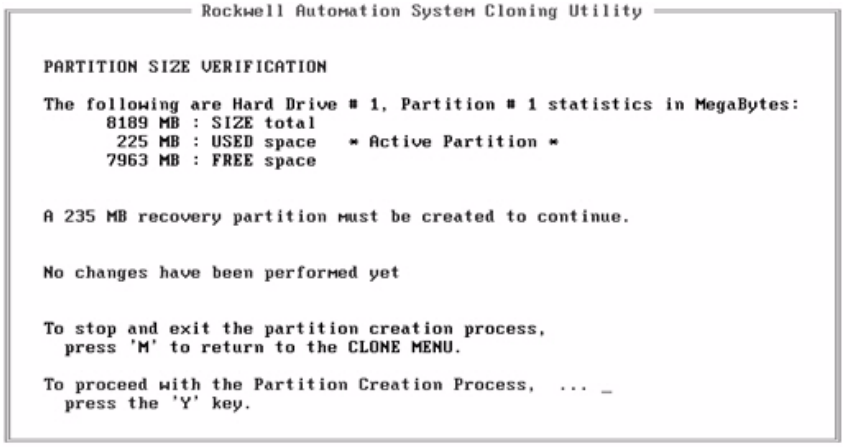
This section creates a partition on your computer's hard drive that is used to store a backup of your active system image. The recovery partition is used only by the cloning utility and is not available to other system resources. If the hard drive does not have a recovery partition, the utility displays a screen to inform you of this condition.

Follow these steps to create a recovery partition:

1. Press C from the Recovery Partition Not Found screen.



2. Press Y from the Partition Size Verification screen.



The hard drive is partitioned to the values indicated on your actual Partition Size Verification Screen.

```
Script Command = SELECT PARTITION NEXT
Script Command = CREATE /FS=FAT32 /LABEL="RECOVERY"

  --- Create Confirmation ---
  Partition will be created with the following parameters:

  Partition Type: FAT32
  New Label:  RECOVERY
  Size: 235.3
  Position: Beginning of free space
  Bad Sector Checking:OFF


      The operation completed successfully.

Script Command = HIDE

  --- Hide Partition ---
  Hiding partition:RECOVERY (FAT32X)

      The operation completed successfully.

Ending Script Execution ==> Thu Jul 24 17:39:53 2008
_
```

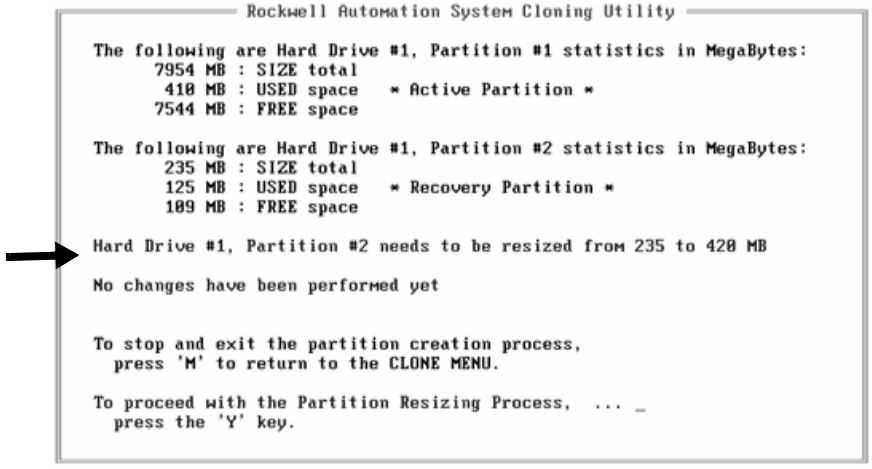
3. Proceed to Back up the Active System Image on page 10.

Resize the Recovery Partition

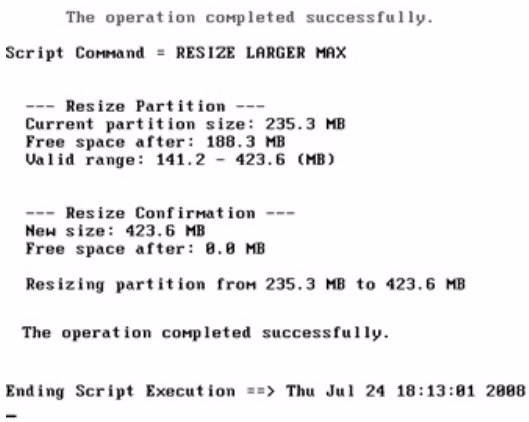
This section shows how the recovery partition on your computer's hard drive is resized if it is too small to archive a system backup image. If this condition occurs, the cloning utility displays an information screen to alert you of the condition.

Follow these steps to resize the recovery partition:

1. Press Y from the Partition Resizing Process screen.



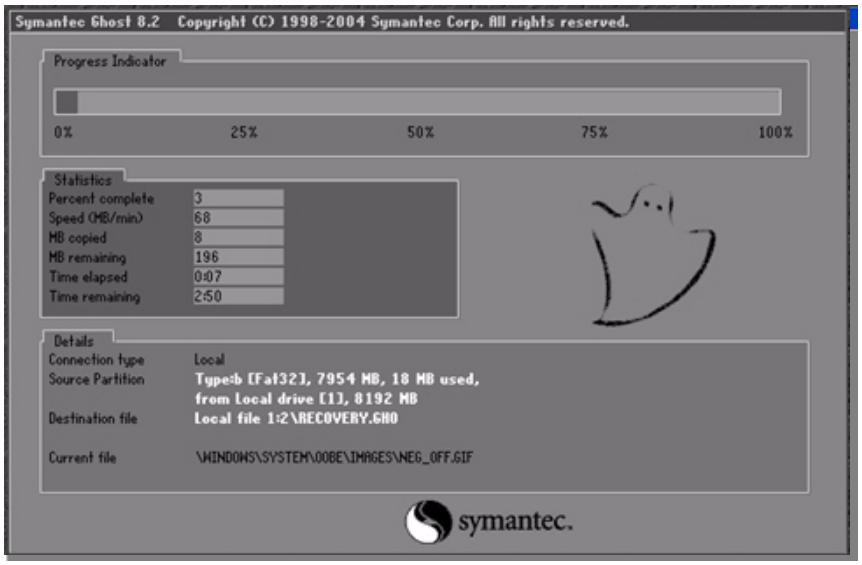
   The hard drive system and recovery partitions are resized to the values indicated on your Partition Resizing Process screen.



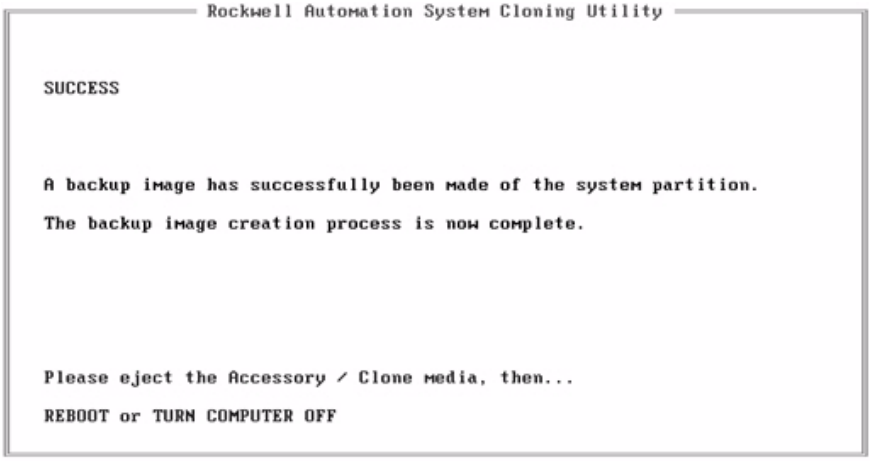
2. Proceed to Back up the Active System Image on page 10.

Back up the Active System Image

This section clones the active system image partition and stores it in an archive file on the recovery partition on your computer's hard drive. The GHOST cloning program launches automatically to perform the process.



When the GHOST cloning process is complete, the cloning program displays the Success Screen.

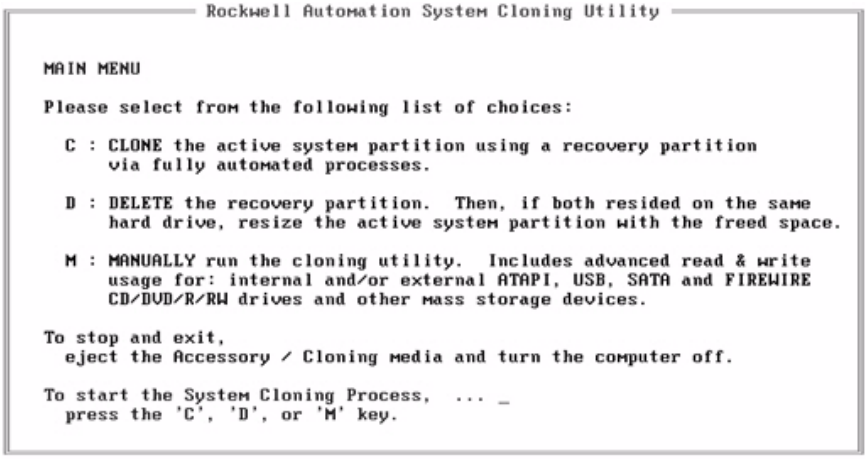


Restore the Backup Image

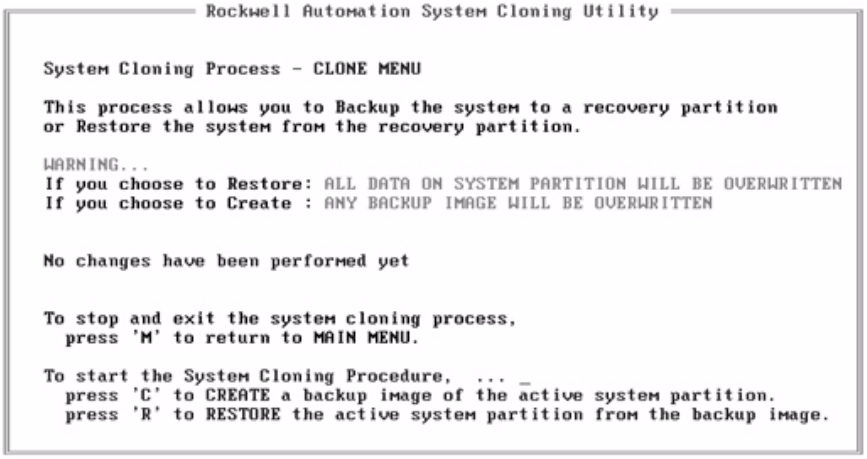
This section shows how to restore a system image from the backup image located in the recovery partition of your computer's hard drive.

Follow these steps to restore the backup image:

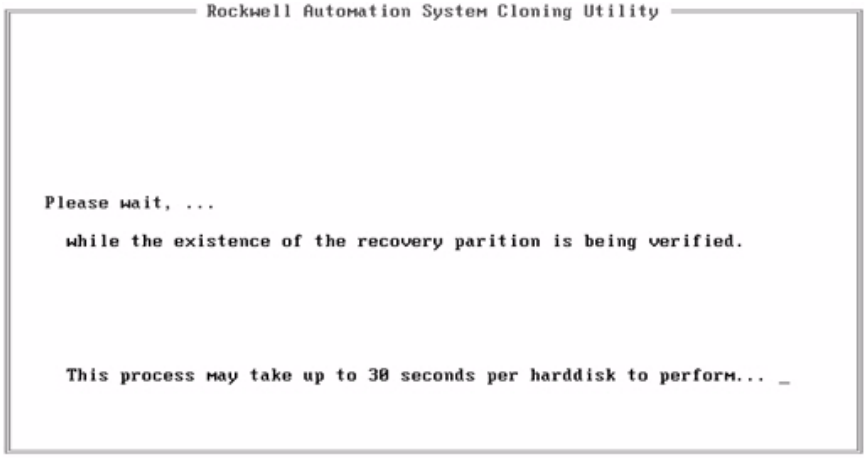
1. Press C from the Main Menu to enter the Clone Menu.



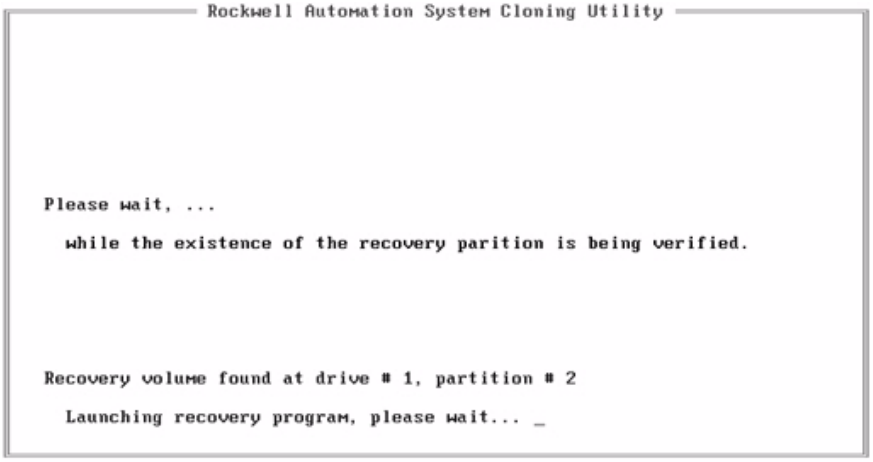
2. Press R from the Clone Menu to restore the backup image.



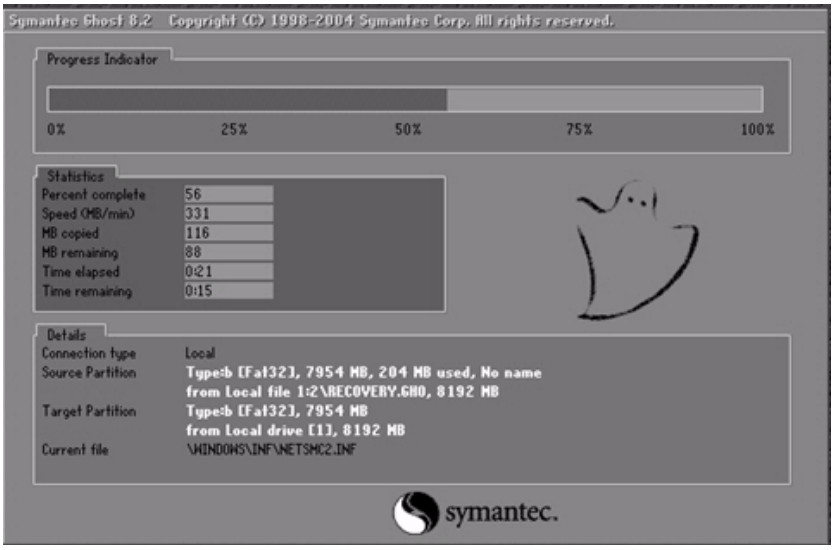
The cloning utility searches for the recovery partition.



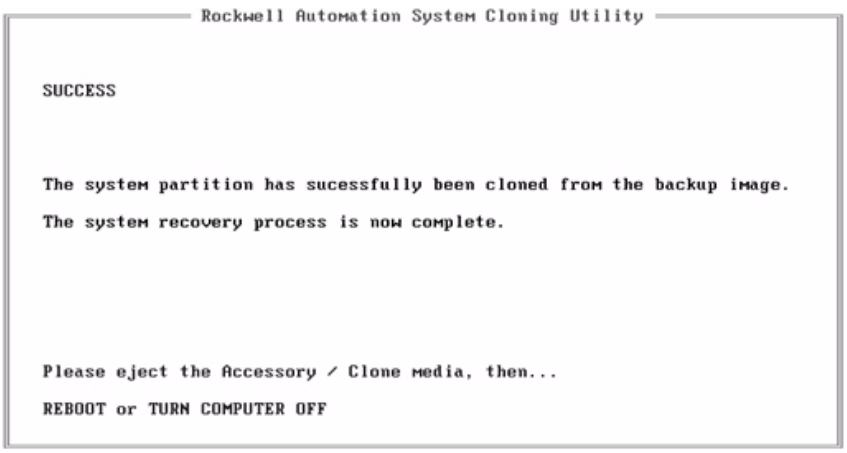
When the recovery partition is found, the following screen appears.



The Ghost cloning program launches and restores the contents of the active system partition from an archive file located in the recovery partition of the hard drive.



When the GHOST cloning process is complete, a Success screen appears.



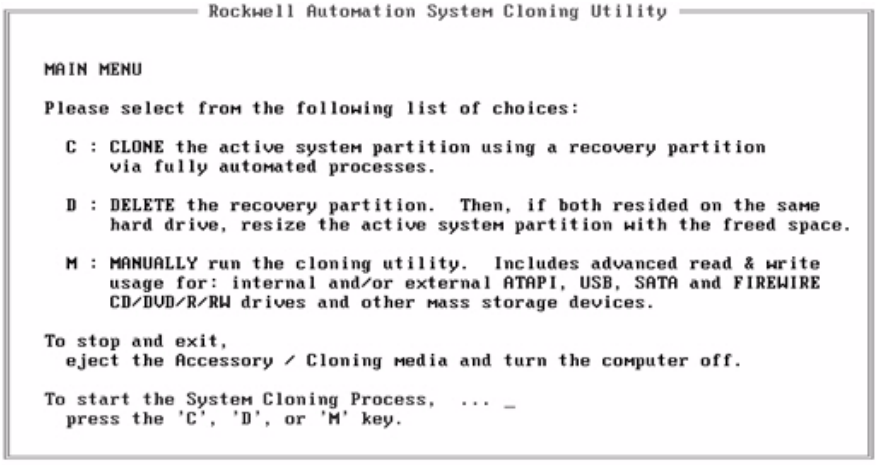
Delete the Recovery Partition

This section shows how to delete a recovery partition from your computer's hard drive. The recovery partition is reserved by the cloning utility for system backups and is not available to other system resources.

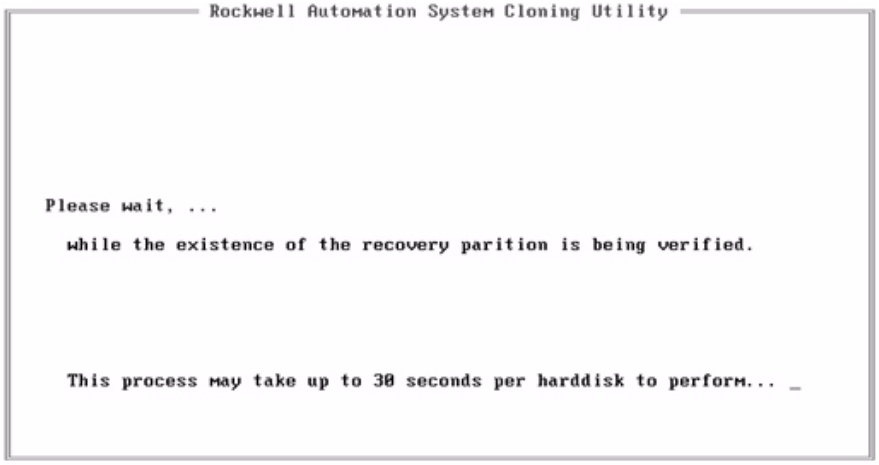
IMPORTANT If you delete the recovery partition, you cannot create a backup of the system image using the cloning utility unless you recreate the partition at a later time.

Follow these steps to delete the recovery partition:

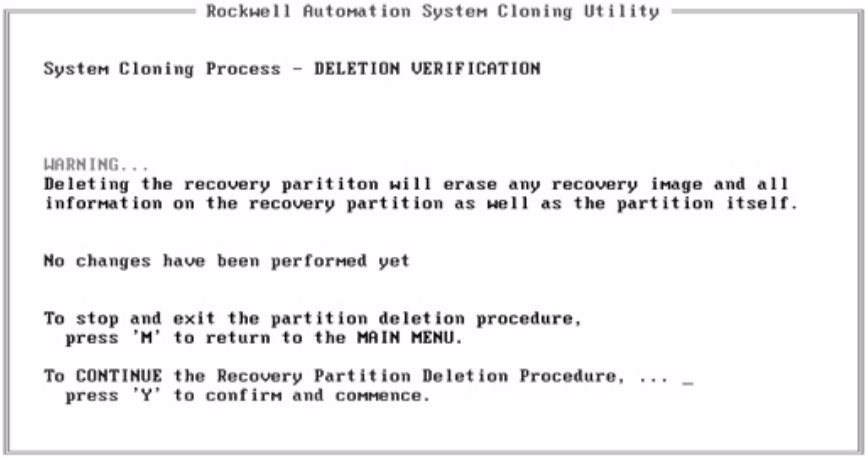
1. Press D from the Main Menu to delete recovery partition.



The cloning utility searches for the recovery partition.



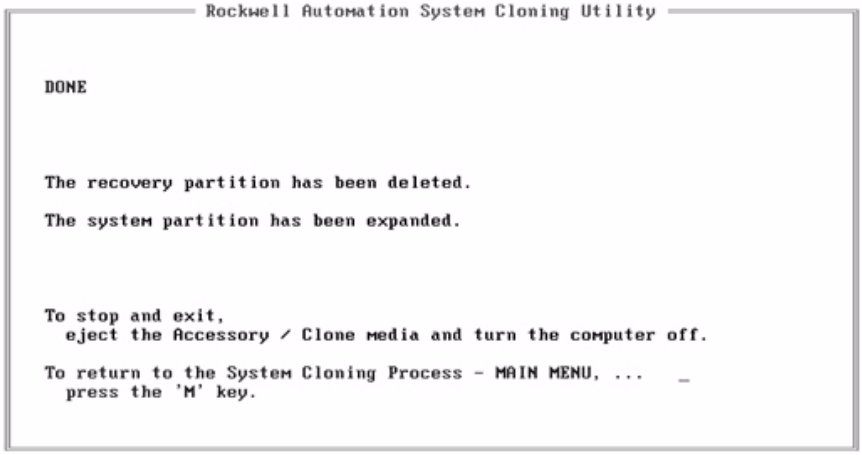
2. Press Y from the Deletion Verification screen to delete the recovery partition.



The recovery partition is deleted and the active system partition is resized with the available space.

```
   Copyright (c) 1994-2004 Symantec Corporation.

Beginning Script Execution ==> Thu Jul 24 17:48:40 2008

Script Command = SELECT DRIVE 1
Script Command = SELECT PARTITION 2
Script Command = DELETE "RECOVERY"

  --- Delete Partition ---
  Deleting partition with volume label:   "RECOVERY"

      The operation completed successfully.

Script Command = SELECT DRIVE 1
Script Command = SELECT PARTITION 1
Script Command = RESIZE LARGER MAX
Entire Progress                4%
_
```

When the recovery partition is removed and the active system partition expanded, this screen appears.



3. Press M to return to the Main Menu.

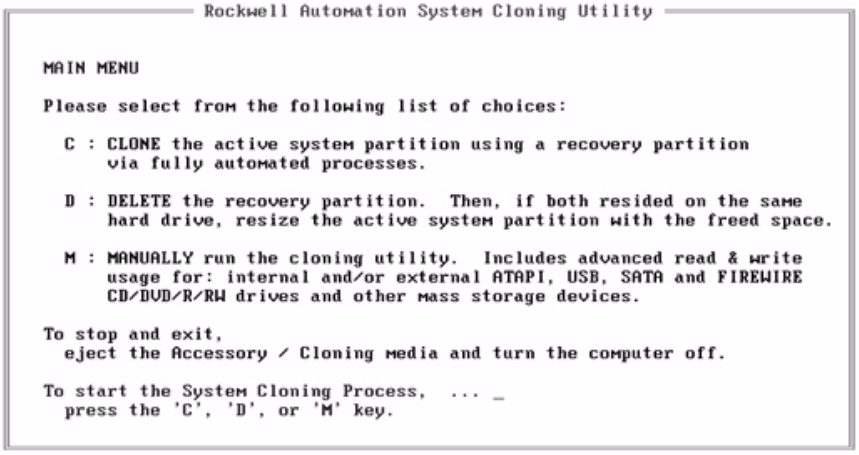
Launch the Ghost Cloning Utility Manually

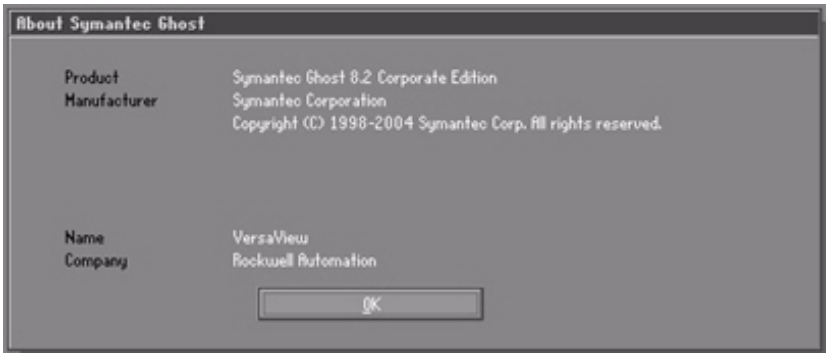
The Ghost Cloning Utility provides advanced read/rewrite operations for internal/external drives and other mass storage devices. Refer to the manual provided by Symantec for GHOST operating instructions and information. An Adobe PDF version of this manual is on the Industrial Computer System Cloning Utility CD. Browse to the folder on a Windows 9x, NT, 2000, or XP operating system:

\Utilities, Manuals\Symantec Ghost

IMPORTANT This version of the cloning utility does not allow the creation of bootable CD/DVD discs though the manual operation of Ghost. Refer to the Advanced Menu for other options to store the system image externally.

Press M from Main Menu to manually launch the Ghost Cloning Utility.





Store a System Image to a Network Location

The Advanced menu loads Ethernet drivers to manually clone a system image to a networked PC.

IMPORTANT For proper operation, follow the procedure steps in the presented sequence.

Disable any firewall programs on the server computer to minimize complications with the file transfers.

Follow these steps to store a system image to a network location:

1. Obtain a laptop or desktop PC running the Microsoft Windows 2000 Operating System or later.

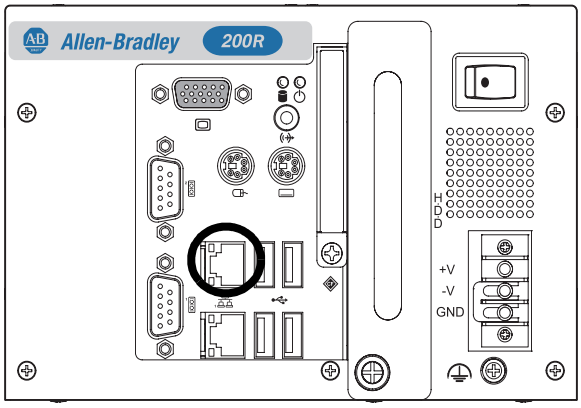
   The laptop or PC acts as the server while the Rockwell Automation industrial computer is the client.

2. Connect the client to the server using a crossover Ethernet cable or using an Ethernet patch cable and a network switch.

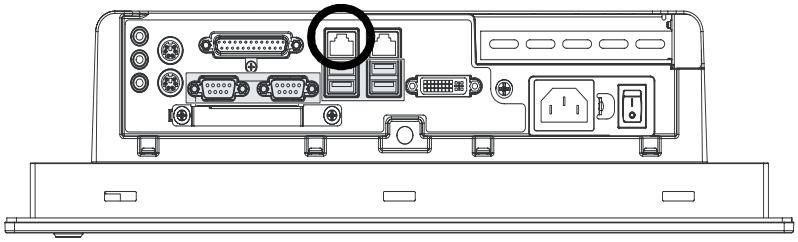
TIP The connection must be configured to use specific IP addresses detailed in the next steps. DHCP enabled IP addresses are not supported.

If there are multiple Ethernet connections on the client machine, make sure they are connected using the Ethernet ports shown.

200R Compact Non-Display Computer

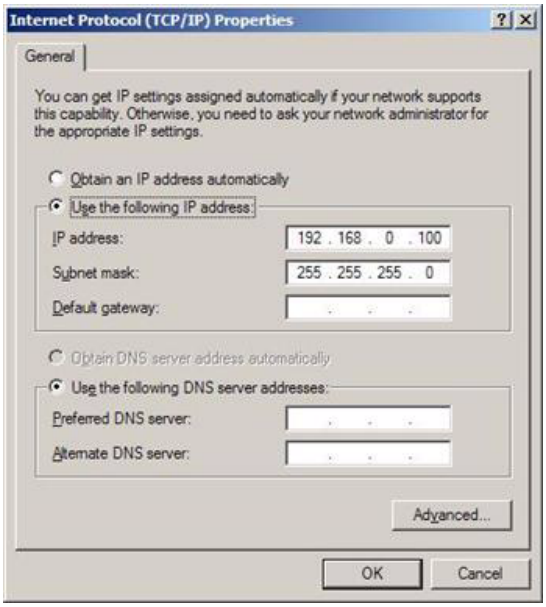


6181P Integrated Display Computer



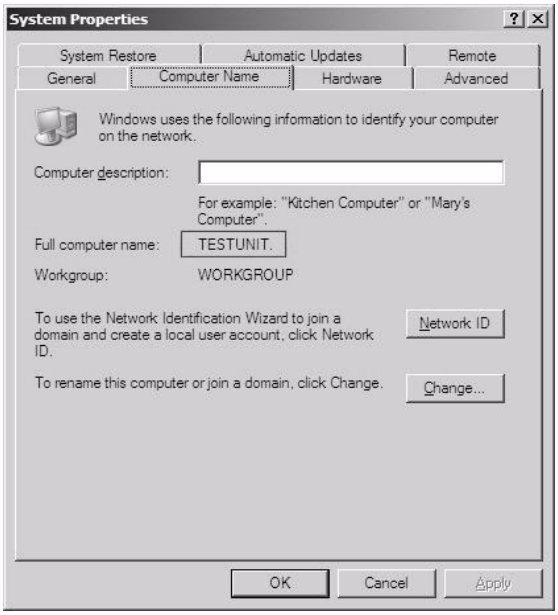
3. On the laptop or PC server, configure the Ethernet port to use the settings shown for TCP/IP.

IMPORTANT The Ethernet connection to the client machine will not work if the IP address is configured differently.



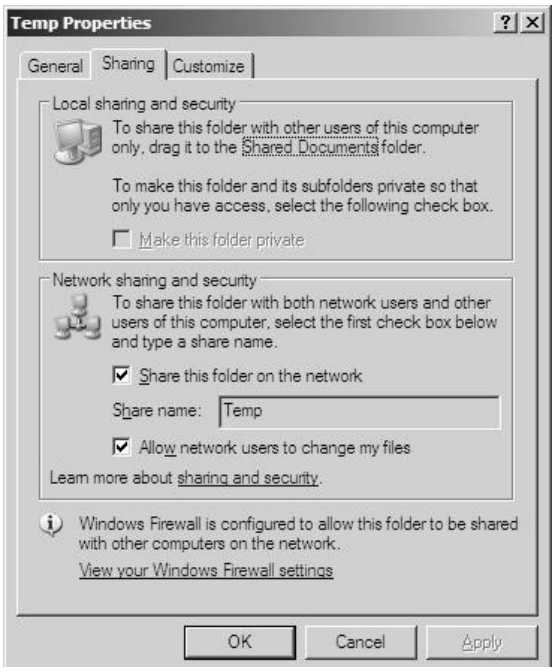
4. Note the computer name of the server.

This example shows a computer name of *testunit*.



5. Create a shared directory on the laptop or PC server computer.

   In this example, the shared directory name is *Temp*.

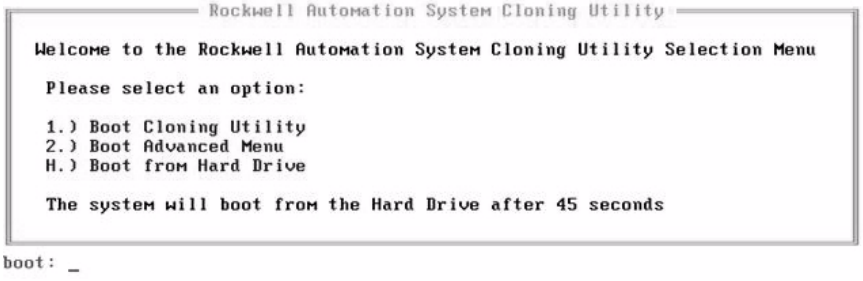


6. Make sure the local administrator account is configured on the laptop or PC server machine.

   The name of the default administrator account in the steps that follow is *administrator*.

7. Power on the industrial computer client machine.

8. Type 2 and press Enter to launch the Advanced menu.



On the industrial computer client machine, you will be prompted for a user name and password.

```
    IOAddress ......... 0x2000
    Interrupt ......... 10
    DMA ............... 0
    Rx Buffers .....    4
    Tx Buffers .....    4

NTSTS: Initialization started.
Installing Network TeleSystems TCP/IP NetBIOS device driver...
Version: TCP/IP 2.09 (960320)
Copyright (c) 1994-1996 Network TeleSystems, Inc.  All rights reserved.
Using: VCs=16  VCSends=6  VCReceiveLarge=6
Driver NTSTS$ in section [NTS$NTST2] will bind to module [NIC].
NTS$NTST2: Initialization succeeded.
IBM DOS LAN Services Driver Version 4.0
Copyright (C) International Business Machines Corporation 1993, 1994
Copyright (C) Microsoft Corporation 1992
  Transport Hooks Enabled

IBM Netbind Version 2.1
NTS$NTST2: NTS0101:
WARNING: Since the MAC driver does not support Loopback, the NTSNX driver may
         be necessary.
IBM DOS NETBEUI 3.00
Type your user ID, or press ENTER if it is ADMINISTRATOR:
Type your domain password:_
```

9. Enter the user name and password configured for the administrator account in step 6.

This screen appears.

```
                Rockwell Automation System Cloning Utility

Welcome to the
    Rockwell Automation System Cloning Utility Advanced Menu
 Server IP should be: 192.168.0.100
 Client IP is: 192.168.0.101
 Subnet Mask: 255.255.255.0
 Type: NET.EXE USE [DRIVE LETTER]: \\[SERVER NAME]\[SHARE NAME]

 [DRIVE LETTER] is the drive on the client that will be mounted
 [SERVER NAME] is the machine name of the server
 [SHARE NAME] is the name of the shared directory on the server

 Type: NET.EXE USE to confirm which drive letters are assigned
 Type: Ghost to begin Symantec Ghost
 Type: menu to display this menu

A:\>_
```

10. Type this command line:

net use [Drive letter]: \\[Server name]\[Share name]

where:

- [Drive letter] is the letter, a to z, of the drive on the client machine.
- {Server name} is the computer name from step 4.
- {Share name} is the shared directory on the server from step 5.

```
Rockwell Automation System Cloning Utility

Welcome to the
    Rockwell Automation System Cloning Utility Advanced Menu
 Server IP should be: 192.168.0.100
 Client IP is: 192.168.0.101
 Subnet Mask: 255.255.255.0
 Type: NET.EXE USE [DRIVE LETTER]: \\[SERVER NAME]\[SHARE NAME]

 [DRIVE LETTER] is the drive on the client that will be mounted
 [SERVER NAME] is the machine name of the server
 [SHARE NAME] is the name of the shared directory on the server

 Type: NET.EXE USE to confirm which drive letters are assigned
 Type: Ghost to begin Symantec Ghost
 Type: menu to display this menu

A:\>net use e: \\testunit\temp
The command completed successfully.

A:\>_
```

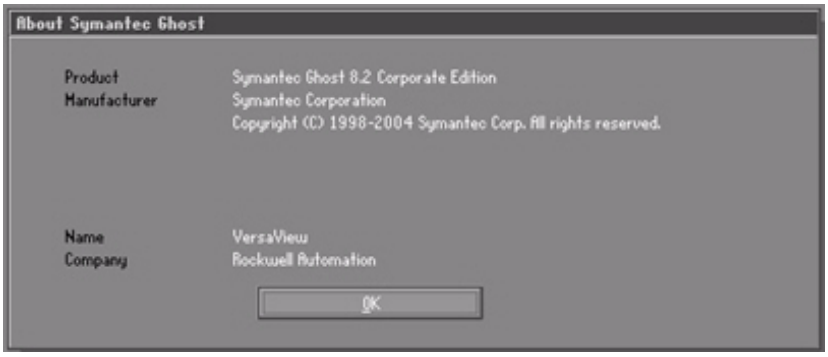
11. Type net use to verify the network directory is mounted correctly.

```
 Server IP should be: 192.168.0.100
 Client IP is: 192.168.0.101
 Subnet Mask: 255.255.255.0
 Type: NET.EXE USE [DRIVE LETTER]: \\[SERVER NAME]\[SHARE NAME]

 [DRIVE LETTER] is the drive on the client that will be mounted
 [SERVER NAME] is the machine name of the server
 [SHARE NAME] is the name of the shared directory on the server

 Type: NET.EXE USE to confirm which drive letters are assigned
 Type: Ghost to begin Symantec Ghost
 Type: menu to display this menu

A:\>net use e: \\testunit\temp
The command completed successfully.

A:\>net use

Status          Local name      Remote name
-------------------------------------------------------------------------------
OK              E:              \\TESTUNIT\TEMP
The command completed successfully.

A:\>_
```

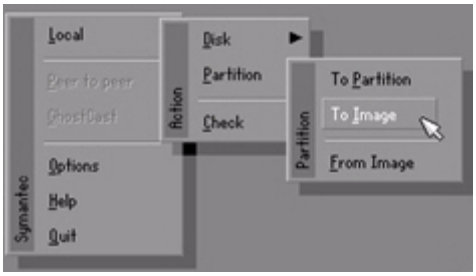
12. Type ghost.exe to launch the Ghost Cloning Utility.

```
 Server IP should be: 192.168.0.100
 Client IP is: 192.168.0.101
 Subnet Mask: 255.255.255.0
 Type: NET.EXE USE [DRIVE LETTER]: \\[SERVER NAME]\[SHARE NAME]

 [DRIVE LETTER] is the drive on the client that will be mounted
 [SERVER NAME] is the machine name of the server
 [SHARE NAME] is the name of the shared directory on the server

 Type: NET.EXE USE to confirm which drive letters are assigned
 Type: Ghost to begin Symantec Ghost
 Type: menu to display this menu

A:\>net use e: \\testunit\temp
The command completed successfully.

A:\>net use

Status          Local name      Remote name
-------------------------------------------------------------------------------
OK              E:              \\TESTUNIT\TEMP
The command completed successfully.

A:\>ghost.exe_
```

13. Click OK when the Ghost Cloning Utility loads.

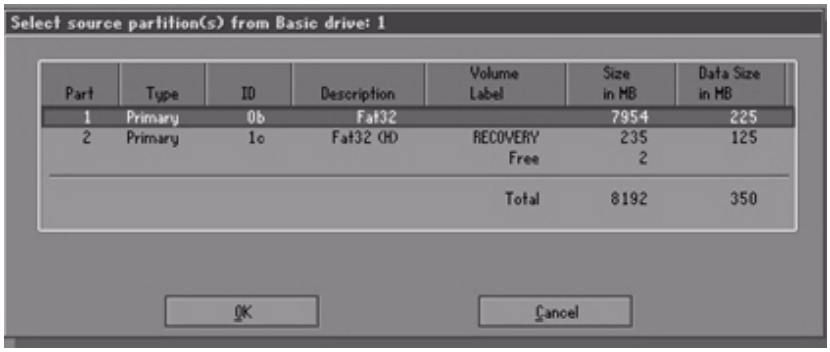


14. Select Local>Disk>To Image or Local>Partition>To Image.

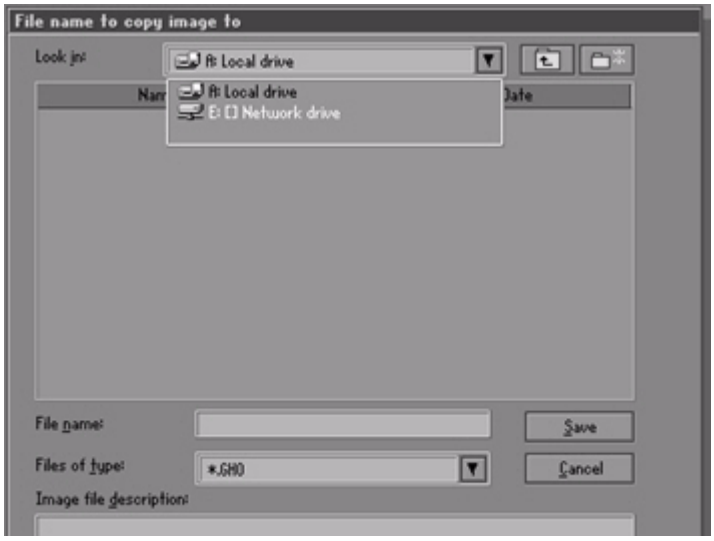


15. Select the source drive and click OK.

16. Select the desired partitions and click OK.

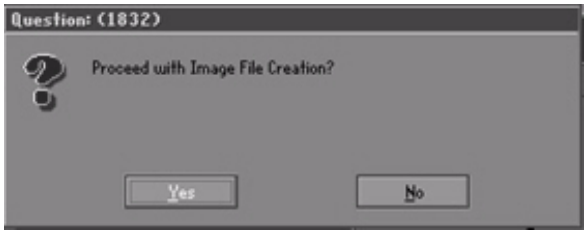


17. Select the network drive that was mounted in step 10.

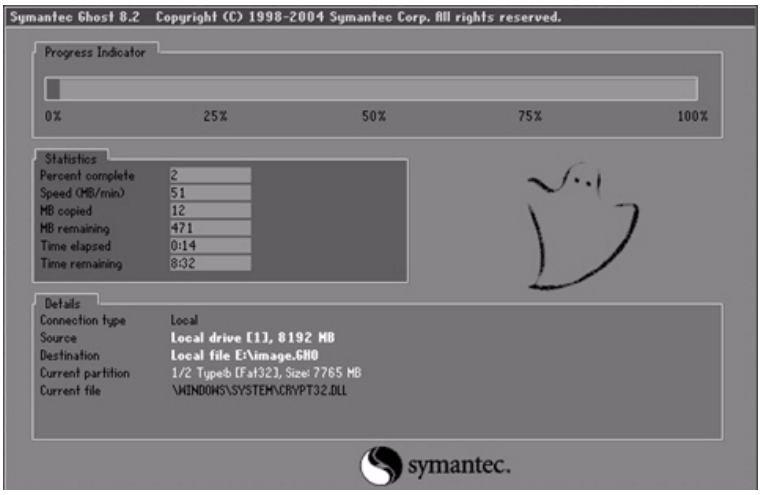


18. Choose compression options.

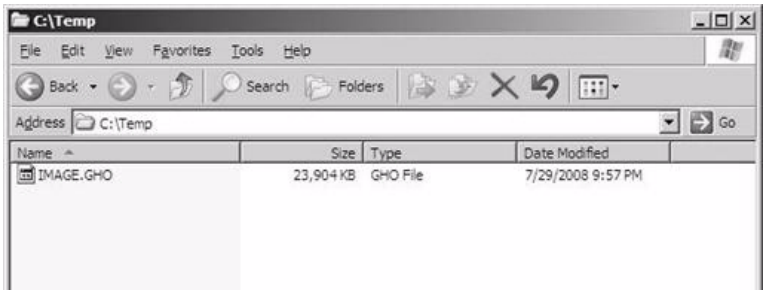
19. Click Yes to proceed with Image File Creation.



The image creation process begins.



The Ghost image file is now visible on the server machine.



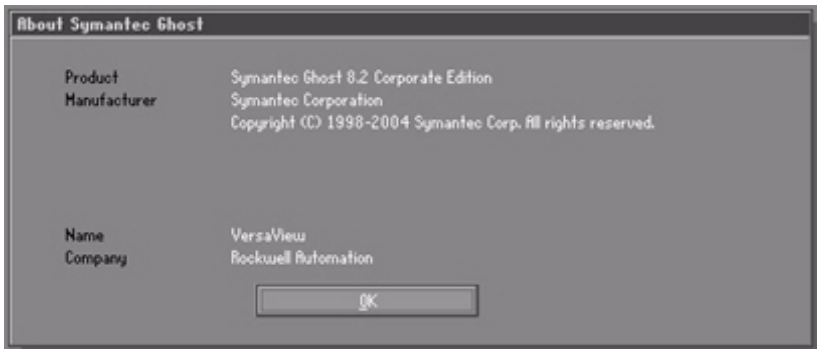
Restore a System Image from a Network Location

Follow these steps to restore a system image from a network location.

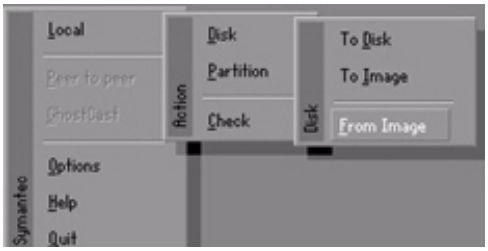
1. Follow steps 1-12 from the Storing a System Image to a Network Location procedure.

   The desired Ghost image files must be in the shared directory on the server machine.

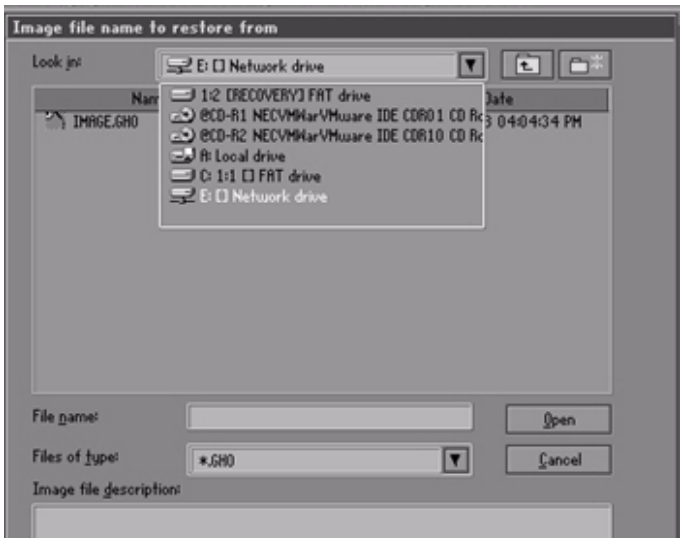
2. Click OK when the Ghost Cloning Utility loads.



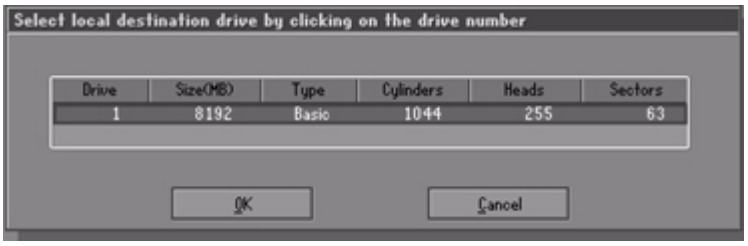
3. Select Local>Disk>From Image or Local>Partition>From Image.



4. Select the network drive which was connected in step 1.

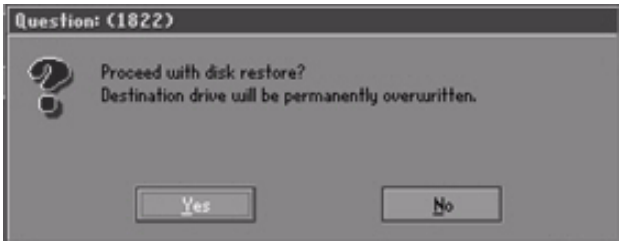


5. Select the local destination drive and click OK.

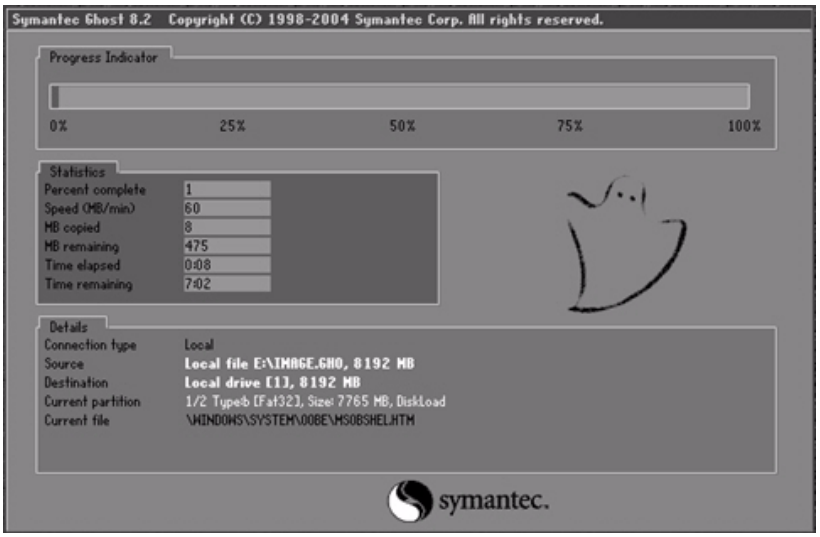


6. Configure the drive partitions, if desired, then click OK.

7. Click Yes to proceed with disk or partition restore.



The restore process begins.



Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

United States	1.440.646.3434 Monday – Friday, 8 a.m. – 5 p.m. EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 6000-TD002A-EN-P - December 2008